

Ohio Site Adds Another 'Good News' Story

This past summer, a very special shipping container, known as the RH-72B Type B cask, arrived at the West Jefferson (WJ-N) site of the DOE Ohio Field Office's Columbus Closure Project (CCP).^{*} The cask came from the Waste Isolation Pilot Project (WIPP) site outside of Carlsbad, NM, with the objective to demonstrate at a waste generating site a simplified process for loading highly radioactive waste drums. The experience gained during this demonstration into methods for future waste shipments of remote-handled transuranic waste (RH-TRU) around the DOE Complex using the 72B cask ^{**}. This demonstration was the latest in a 5-year series of cooperative ventures between Battelle and WIPP to streamline TRU waste characterization, packaging and shipment processes.



Here is how a site with a need to do things more simply and cheaply has helped build efficiency, flexibility, and lower costs into the national program for RH-TRU.

^{*} The project is also known as the Battelle Columbus Laboratories Decommissioning Project (BCLDP), facilities that conducted nuclear research under federal and private sector contracts from the mid-1940s through the mid-1980s.

^{**}TRU waste can be anything contaminated with man-made radioactive elements heavier than uranium. It can be generated in the manufacture of weapons-grade plutonium and when reprocessing reactor fuel and irradiated targets. This can include contaminated protective clothing, tools, piping, air filters, and small amounts of transuranic elements.

- In 1998, when CCP and Battelle staff members turned their attention to decontaminating and decommissioning (D&D) the WJ-N site, they recognized that a major challenge would be to reduce the volume and dispose of the TRU waste generated by the clean-out of the hot cells. The original projection was there would be more than 8,000 drums of TRU waste!
- Most of this waste would have radiation levels requiring remote handling and lots of shielding. At the time, there was only one Type B shipping cask for remote handled TRU potentially available, the WIPP-designed RH-72B – and it was still on the drawing board. The RH-72B cask could carry only three drums and required extensive infrastructure to load the drums.
- Shipment of 8,000 drums in the RH-72B would have taken years. Clearly something needed to be done to reduce the volume of waste.
- To address the volume reduction requirement, staff working on the CCP/BCLDP developed a sorting, screening, and decontamination process. This process relied on in-the-field measurements to determine which materials could be decontaminated to LLW levels—in the end providing a 95 percent reduction in TRU waste volumes, compared to the original projection. Another benefit was that the processes used did not generate significant secondary wastes.
- The TRU waste characterization and packaging process was reviewed by the U.S. Environmental Protection Agency (EPA) and the National Academy of Sciences (at WIPP's request) and has become the model for the national TRU program.
- If the cleanup of the West Jefferson site was to be completed by 2006, team leaders realized they still had to find a more efficient means of shipping the site's waste. Thus project staff began searching for an alternative shipping cask.
- Coincidentally, in 1998 a company called Duratek began the fabrication of a large Type B cask, which was to have a 10-drum capacity and was named the CNS 10-160B. This cask seemed likely to also meet the shielding requirements for the WJ site's type of waste.
- With seed money from DOE's EM-50 sector, the team began an evaluation of what would be necessary to make the cask acceptable for shipping TRU from small quantity generators. Battelle staff worked with Duratek to design components for the 10-160B that would allow easy loading and unloading of high-dose waste drums, including: 5- and 10-drum pallets, a unique locking/lifting fixture, a shield ring for free-air lifts of high-dose drums, and a rotating lifting block for precision control and true remote

operations. Miniature video cameras that could be mounted on crane hooks or around a loading area to guide the crane operator completed the outfitting.

- The West Jefferson staff demonstrated the remote loading capability for the cask using only basic site equipment (e.g., an overhead crane). Additional loading/unloading demonstrations were conducted at WIPP and the DOE site at Hanford, WA, where the RH-TRU waste was to be stored until the WIPP site can receive it.

- Battelle and WIPP staff completed the analyses that supported an amendment to the cask's license, making it suitable for shipping the BCLDP/CCP's TRU waste from the WJ-N site to WIPP. WIPP added the CNS 10-160B cask with its 10-drum payload to its program as an acceptable alternative to the smaller capacity RH-72B.



- Battelle continued to work with Duratek to prepare the amendment to the 10-160B's license to raise the limit on the level of radioactivity that could be carried. The approval of the amendment expanded the cask's usefulness not just for RH-TRU waste but for many other waste streams as well.

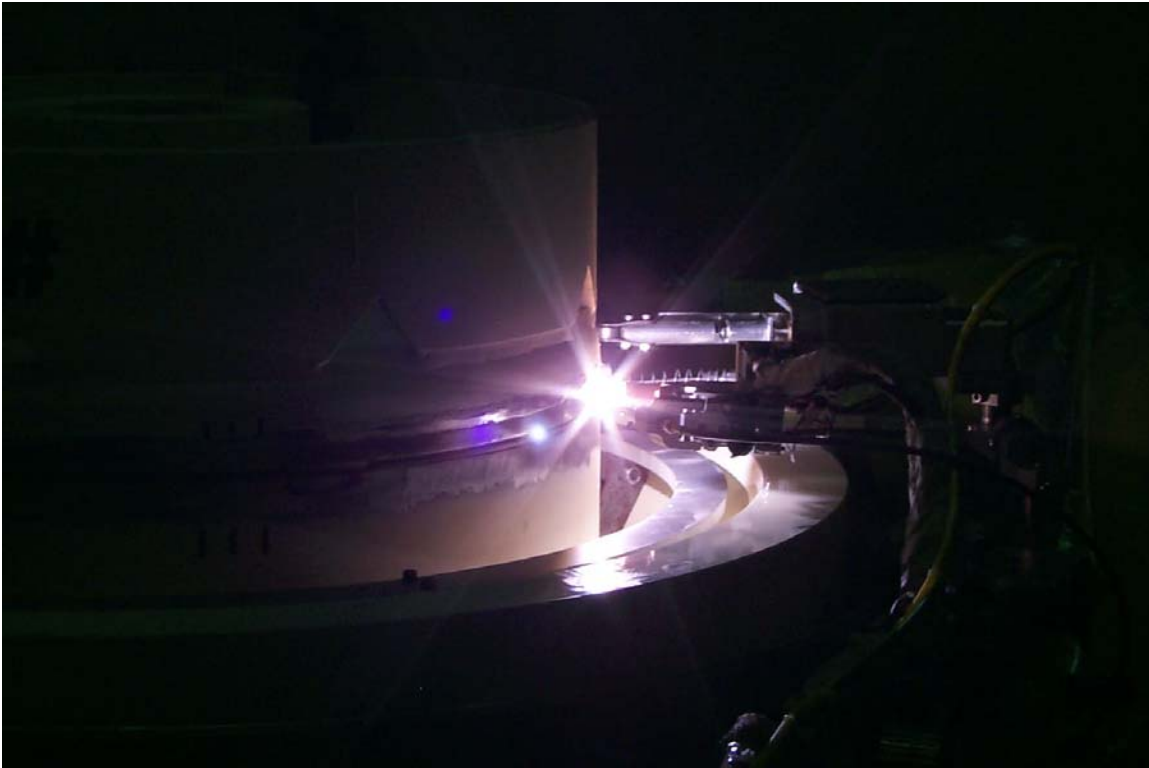
- December 18, 2002, was a major milestone. The first load of remote-handled TRU waste in this country in more than 13 years was shipped from the WJ-N site to Hanford in a CNS 10-160B cask. This event followed more than two years of interactions and coordination with the corridor states along the route.

- Despite this success, it turns out that there were two drums of TRU waste at the West Jefferson site which could not be shipped in the 10-160B because of their

- plutonium levels. The U.S. Nuclear Regulatory Commission (NRC) rule states that single containment casks (the 10-160B is an example) cannot hold more than a total

of 20 curies of plutonium for any shipment. The RH-72B cask, which has an inner canister, is not subject to this restriction. However, the RH-72B casks had never actually been loaded with TRU drums, and its handling procedures were still in draft form.

- From this need, the latest successful cooperative venture between the West Jefferson and WIPP sites was born. The D&D work required casks for storage, while WIPP needed a more simplified process for loading the RH-72B inner canister, including an inexpensive and transportable process for remotely welding the canister lid.



While the planning for this demonstration was in its early stages, additional TRU shipments from West Jefferson were halted by a court injunction. Despite the injunction, the project needed to clear the filled TRU waste drums out of the way of on-going building D&D work.

- The packaged TRU drums are being staged inside the shielded vaults in a constructed facility outside the site remediation area. Most D&D waste could be staged on the 5-drum pallets that could be loaded directly into the 10-160B casks once shipping approval is received. The project decided to store the two drums of high-plutonium TRU waste and three drums of mixed TRU waste in two of the RH-72B shipping casks.
 - WIPP provided canisters for the RH-72B shipping casks and engineering

support. Battelle identified a specialty welding firm in the Atlanta area that had a transportable unit that can remotely weld the canister lids to meet the required specifications. Then Battelle staff demonstrated drum loading, welding of the canister, and placing the canisters into the shipping casks, all within the open high-bay of one of the buildings (JN-1) at the West Jefferson site.

- This exercise allowed WIPP to finalize procedures for handling the RH-72B cask, a critical step in the national program to manage and dispose of RH-TRU waste. Also, the CCP staff achieved the distinction of being the only site to have successfully loaded RH-TRU waste into the two Type B shipping casks certified to carry this waste. And when WIPP receives its RH-TRU permit, the CCP will be the first site to have shipped RH-TRU in both types of shipping casks.